

Vegetated Swale Maintenance Plan

1 Objectives: The maintenance objectives for vegetated swale systems include keeping up the hydraulic and removal efficiency of the channel and maintaining a dense, healthy grass (or plant) cover.

2 Inspection Schedule

2.1 Visual inspections shall be conducted monthly, particularly after heavy runoff, to ensure normal functioning of swale (i.e. no pooling, or blockage)

2.2 Detailed inspections shall be conducted at least twice annually with inspections occurring (1) at the end of the wet season to schedule summer maintenance, (2) before major fall runoff in preparation for winter, and (3) after periods of heavy runoff. The objective of detailed inspections is to identify erosion, damage to vegetation, grass or plant height, debris, litter, areas of sediment accumulation, and pools/standing water. If any issues exist, activities as outlined in Section 3, Maintenance Activities will be conducted.

3 Maintenance Activities

3.1 Routine or preventative maintenance refers to procedures that are performed on a regular basis to keep the swale aesthetic and in proper working order. Routine maintenance includes debris removal, silt and sediment removal, and clearing of vegetation around flow control devices to prevent clogging. Routine maintenance also includes the maintenance of a healthy vegetative cover. Dead turf or other unhealthy vegetative areas will need to be replaced after being discovered.

3.1.1 Erosion: Areas of erosion and slope failure shall be repaired and reseeded (or sodded) as soon as possible. Eroded areas near the inlet or outlet may also need to be lined with riprap, which will be determined on a case by case basis.

3.1.2 Damage to vegetation: If the channel develops ruts or holes, it shall be repaired utilizing a suitable soil that is properly tamped and seeded. The grass cover should be thick; if it is not, it shall be reseed as necessary. If possible, flow will be redirected until new grass is firmly established to avoid deterioration. If invasive species and/or weeds develop, promptly remove to avoid disruption to original vegetation.

3.1.3 Grass or plant height: Mow as required by plant variety to maintain at least a 4-6" grass height or to suppress weeds and woody vegetation. Litter must be removed prior to mowing. During the growing season mow as indicated by species to promote growth and pollutant uptake. Remove cuttings and dispose /compost. **Species in the swale include:** _____

- 3.1.4 Debris / litter:** Remove all litter or debris within swale and prior to mowing and as inspections warrant. Keep swale free of debris.
- 3.1.5 Areas of sediment accumulation:** Remove sediment by hand with a flat-bottomed shovel whenever sediment covers vegetation or begins to reduce swale capacity. Maintain clean curb cuts to avoid soil and vegetation buildup. Sediment accumulating near culverts and in channels should be removed when it builds up to 75 mm (3 in.) at any spot, or covers vegetation. *If inlet flow spreaders and/or under drains installed:* keep all inlet flow spreaders even and free of debris. If cobbles or other similar flow spreaders are used, ensure that cobbles do not become embedded in sediment. Remove any debris in under drains that could cause clogging. [At least two times per year]
- 3.1.6 Pools and standing water:** Observe soil at the bottom of the swale for uniform percolation throughout. If portions of the swale do not drain within 72 hours after the end of a storm, the soil shall be tilled and replanted. Remove any debris or accumulation of sediment.
- 3.1.7 Irrigation:** Water plants in swales during dry conditions. Confirm that irrigation is adequate and not excessive.
- 3.1.8 Pesticides and Fertilizers:** Application of pesticides and fertilizers shall be minimal. Biological, physical, and cultural controls shall be used prior to pesticide and fertilizer use.
- 3.2 Non-routine or corrective maintenance** refers to any rehabilitative activity that is not performed on a regular basis. This includes flow control structure replacement or the major replacement and cleaning of aquatic vegetation. Non-routine maintenance will be completed as needed.

4 Vector Control

4.1 Objective: To prevent conditions within swales that attract and/or promote the growth of disease vectors, including but not limited to mosquitos, rodents, and flies.

4.2 Maintenance Activities for Vector Control

- 4.2.1 Inspections:** Regular inspections will determine if swales have pools of standing water or debris accumulation. Inspections will be conducted prior to the rainy season, after major storm events, and at least once during the dry season to ascertain that standing water drains from the swale within 72 hours.
- 4.2.2 Holes in ground:** Abate potential vectors by filling holes in the ground in and around the swale and by insuring that there are no areas where water stands longer than 72 hours following a storm.

4.2.3 Other maintenance activities: If any obstructions develop (e.g. debris accumulation, invasive vegetation, clogging of outlets and/or under drains) within the swale, appropriate maintenance activities shall be implemented to correct the obstruction. Refer to Section 3 for details on specific maintenance activities.

4.3 Mosquito Abatement District: The Alameda County Vector Control Services District (ACVCSD) will be contacted as needed for assistance should any mosquito issues arise. Mosquito larvicides should be applied only when absolutely necessary as indicated by the ACVCSD, and then only by a licensed professional or contractor. The contact information for ACVCSD follows:

Alameda County Vector Control Services District
1131 Harbor Bay Parkway, STE 166
Alameda, CA 94502

Phone 510-567-6800
Fax 510-337-9137
ehvector1@acgov.org

5. Correspondence

Correspondence regarding operations, inspections and maintenance will be provided to the City of Fremont's Environmental Services division as required and according to the schedule outlined in the Operations and Maintenance Agreement held with the City of Fremont in regards to this property.